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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE: U. S. PATENT NO. 6,828,372, entitled RAILROAD TIE AND METHOD FOR MAKING SAME

Issued: December 7, 2004

Inventors: Sullivan, et al.

Serial No. 09/800,171

Filed: 5 March 2001

CERTIFICATE OF CORRECTION

Attn: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sirs:

Enclosed is a proposed Certificate of Correction relating to the above-identified United States patent.

Correction to Claim No. 33 (Application Claim No. 16)

The first correction relates to a semi-colon that is missing from the 18th line of Claim 33 (see Col. 12, line 60), which is clearly typographical in nature. It currently reads:

placing said member about a cooling apparatus

It should be amended so that it has a semi-colon at the end of this phrase to read:

placing said member about a cooling apparatus;

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Correction to Claim No. 37 (Application Claim No. 34)

The second correction resulted from a failure of the USPTO to properly duplicate the preamble and the 4th step of Claim 37 in the issued patent. The allowed Claim 34 (renumbered by the Patent Office as Claim 37) from Page 7 of an amendment filed 5 December 2003, which is attached hereto as “*Exhibit A*,” is different from the version in the issued patent, attached here to as “*Exhibit B*”.

The preamble of issued Claim 37 (Col. 13, line 8) currently reads:

“37. A process for **form ma** a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:” (emphasis added)

The 4th step of Claim 37 (Col. 13, lines 17-20) currently reads:

feeding said mixture into a mold having at least one side wall, said mixture at least partially **fume** said mold, such that said mixture has at least one side surface and an interior portion; (emphasis added)

The preamble of Claim 37 and the 4th step of Claim 37 should be revised in accordance with Claim 34 as set forth in the December 2003 amendment in which all claims were found to be allowable. The respective portions in the “*Exhibit A*” read as follows.

“A process for **forming** a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:” (emphasis added)

“feeding said mixture into a mold having at least one side wall, said mixture at least partially **filling** said mold, such that said mixture has at least one side surface and an interior portion;” (emphasis added)

Another typographical error in Claim 37 requires the replacement of “said” with “a” with regards to the first reference to a valve in Col. 13, line 24, in order to provide an antecedent basis. Claim 37 (with the aforementioned Patent Office errors) currently reads:

37. A process for forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing portions from about 25% to about 55% of a thermoplastic polymer,
with from about 4% to about 55% of a rubbery polymeric component;
with from about 4% to about 55% of a reinforcing filler until said portions
form a flowable mixture;

feeding said mixture into a mold having at least one side wall, said mixture at
least partially filling said mold, such that said mixture has at least one side surface and
an interior portion;

using a Banbury mixer or other closed chamber mixer to mix said mixture;

using an extruder between said Banbury mixer or other closed chamber mixer
and said valve to transport said mixture to said valve;

adjustably controlling a density of said extrudable material; and

wherein at least one brake and/or at least one gear is used to control said
density.

An “a” should replace the first “said” before “valve” to provide an antecedent basis. The Claims 33 and 37 should be corrected to read as follows. Using standard MPEP procedures, we have used brackets for deletion of text and underlining for addition of text.

33. A process for forming a member having a plurality of surfaces, for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing,

about 25% to about 55% of a thermoplastic polymer;

about 4% to about 55% of a rubbery polymeric component;

about 4% to about 55% of a reinforcing filler;

injecting said mixture into a mold having at least one wall, wherein said

mixture at least partially fills said mold about said wall, such that said mixture has at least one side surface along said wall and an interior portion;

cooling said mixture whereby said at least one surface is at least partially hardened thereby at least partially forming a member;

removing said member from said mold before said interior portion is substantially hardened;

placing said member about a cooling apparatus;

rotating said member about said cooling apparatus whereby said interior is at least substantially hardened; and

texturing at least one surface of said member.

37. A process for [form ma] forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing portions from about 25% to about 55% of a thermoplastic polymer, with from about 4% to about 55% of a rubbery polymeric component;

with from about 4% to about 55% of a reinforcing filler until said portions form a flowable mixture;

using a Banbury mixer or other closed chamber mixer to mix said mixture;

using an extruder between said Banbury mixer or other closed chamber mixer and [said] a valve to transport said mixture to said valve;

feeding said mixture into a mold having at least one side wall, said mixture at least partially [fume] filling said mold, such that said mixture has at least one side surface and an interior portion;

adjustably controlling a density of said extrudable material; and

wherein at least one brake and/or at least one gear is used to control said density.

The typographical error in Claim 33 was the result of an inadvertent error by the applicants and occurred through no fault of the United States Patent and Trademark Office. The typographical errors in Claim 37 were the result of error in the United States Patent and Trademark Office and the result of inadvertent typographical error by the applicants.

Accordingly, a check in the amount of \$100.00 is enclosed to correct such errors. The director is hereby authorized to charge and credit Deposit Account Number 13-2166 in order to credit any overpayment or charge any additional fee required.

Respectfully submitted,

3.22.2005

Date

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CERTIFICATE OF MAILING "EXPRESS MAIL" (37 CFR 1.10)

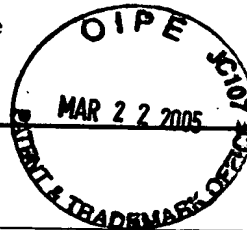
Applicant(s): Sullivan, et al

Docket No.

Tie Tek-001

Serial No.
09/800,171Filing Date
5 March 2001Examiner
Cain, Edward J.Group Art Unit
1714

Invention: New and Improved Railroad Tie & Method for Making Same

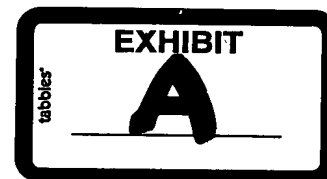
**FILE**

I hereby certify that the following correspondence:

Transmittal Letter (General Patent-Pending) and all documents referenced therein.

(Identify type of correspondence)

is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

5 December 2003*(Date)*Matt Robinson*(Typed or Printed Name of Person Mailing Correspondence)**(Signature of Person Mailing Correspondence)*EV 294300355 US*("Express Mail" Mailing Label Number)***Note: Each paper must have its own certificate of mailing.**

TRANSMITTAL LETTER
(General - Patent Pending)

Docket No.
Tie Tek-001

In Re Application Of: Sullivan, et al

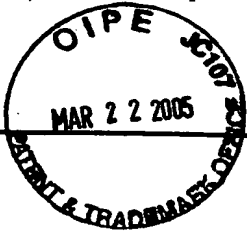
Serial No.
09/800,171

Filing Date
5 March 2001

Examiner
Cain, Edward J.

Group Art Unit
1714

Title: New and Improved Railroad Tie & Method for Making Same



FILE

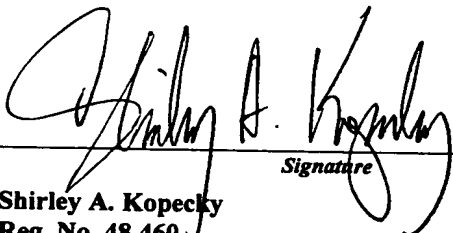
TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith is:

Return Post Card; Check #17476 in the amount of \$86.00 (extra independent claims fee);
Certificate of Express Mailing-No. EV 294300355 US; and
Response and Amendment to the Office Action dated September 5, 2003 (w/replacement specification paragraph, listing of currently pending claims and remarks).

in the above identified application.

- ☐ No additional fee is required.
- ☒ A check in the amount of \$86.00 is attached.
- ☒ The Director is hereby authorized to charge and credit Deposit Account No. 13-2166 as described below.
- ☐ Charge the amount of
- ☒ Credit any overpayment.
- ☒ Charge any additional fee required.


Signature

Shirley A. Kopecky
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Dated:

5 December 2003

I certify that this document and fee is being deposited on _____ with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature of Person Mailing Correspondence

Typed or Printed Name of Person Mailing Correspondence

cc:

AMENDMENT TRANSFERRAL LETTER (Small Entity)

Applicant(s): Henry W. Sullivan

Docket No.

Tie Tek-001

Serial No.
09/800,171

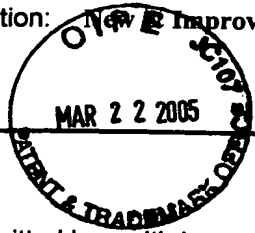
Filing Date
5 March 2001

Examiner
Cain, Edward J.

Group Art Unit
1714

Invention: ~~New~~ Improved Railroad Tie & Method for Making Same

FILE



TO THE COMMISSIONER FOR PATENTS:

Transmitted herewith is an amendment in the above-identified application.

- ☒ Small Entity status of this application has been established under 37 CFR 1.27 by a verified statement previously submitted.
- ☐ A verified statement to establish Small Entity status under 37 FR 1.27 is enclosed.

The fee has been calculated and is transmitted as shown below.

CLAIMS AS AMENDED

	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST # PREV. PAID FOR	NUMBER EXTRA CLAIMS PRESENT	RATE	ADDITIONAL FEE
TOTAL CLAIMS	52 -	67 =	0 x	\$9.00	\$0.00
INDEP. CLAIMS	12 -	10 =	2 x	\$42.00	\$86.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>					\$0.00
TOTAL ADDITIONAL FEE FOR THIS AMENDMENT					\$86.00

- ☐ No additional fee is required for amendment.
- ☐ Please charge Deposit Account No. _____ in the amount of _____
- ☒ A check in the amount of \$86.00 to cover the filing fee is enclosed.
- ☒ The Director is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 13-2166
- ☒ Any additional filing fees required under 37 C.F.R. 1.16.
- ☒ Any patent application processing fees under 37 CFR 1.17.

Shirley Kopecky
Signature

Dated: 5 December 2003

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I certify that this document and fee is being deposited on _____ with the U.S. Postal Service as first class mail under 37 C.F.R. 1.8 and is addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signature of Person Mailing Correspondence

Typed or Printed Name of Person Mailing Correspondence

cc:

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Sullivan, et al



Serial No.: 09/800,171

Filed: 5 March 2001

For: *New & Improved Railroad
Tie & Method for Making
Same*

Attorney Docket: Tie Tek-001

Examiner: Edward J. Cain

Art Unit: 1714

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ARLINGTON, VA 22313-1450

**RESPONSE AND AMENDMENT TO THE OFFICE ACTION OF
SEPTEMBER 5, 2003**

Responsive to the Office Action of September 5, 2003, Applicants herewith submit the following amendments and remarks:

AMENDMENTS TO THE SPECIFICATION begin on page 2 of the office action.

AMENDMENTS TO THE CLAIMS begin on page 3 of the office action.

REMARKS/ARGUMENTS begin on page 15 of the office action.

Appl. No.: 09/800,171
Amendment dated Dec. 5, 2003
Reply to Office action of Sept. 5, 2003

AMENDMENTS TO SPECIFICATION:

Please make the following changes to the specification:

Page 8, line 13 of text: change "arregonite" to "aragonite".

Finally, the reinforcing filler is preferably comprised of at least one of the materials selected from the group of materials consisting essentially of carbon black, fly ash, mica, fiberglass, ~~arregonite~~ aragonite, crushed concrete, sand and crushed glass or any combination thereof.

IN THE CLAIMS:

Claims 12, 18-28, and 51-67 were previously cancelled. Claims 1-11, 13-17, and 29-50 are pending, and Claims 2-11 and 16 have been allowed.

Please cancel Claims 15, 17, 32, 38, and 43-50.

Claims 34, 41, and 42 are rewritten in independent form as per the Examiner's allowance.

Please also amend the claims as follows, and add Claims 68-94 (none constitute new matter) as follows:

CLAIMS:

1. (Currently Amended): An individually ~~or substantial~~ individually molded member for use as a railroad tie, ~~lumber~~ or other structural member having a constant density, comprising:

_____ a mixture of:

from about 25% to about 55% of a thermoplastic polymer;

from about 4% to about 55% of a rubbery polymeric component; and

from about 4% to about 55% of a reinforcing filler; and

wherein said member is formed by extruding said mixture into an individual mold and wherein said constant density is controlled during a filling of said mold.

2. (Allowed): A process for forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing materials comprising,

from about 25% to about 55% of a thermoplastic polymer;

from about 4% to about 55% of a rubbery polymeric component; and

from about 4% to about 55% of a reinforcing filler;

injecting or extruding said mixture into a mold having at least one side, said mixture at least partially filling said mold, such that said mixture has at least one side surface and an interior portion;

cooling said mixture whereby said at least one side surface is at least partially

hardened, thereby at least partially forming a member;

removing said member from said mold before said interior portion of said mixture is substantially hardened;

placing said member within or about a cooling apparatus; and

rotating said member about said cooling apparatus whereby said interior is at least substantially hardened.

3. (Allowed): The method of Claim 2 wherein said thermoplastic polymer is comprised of at least one of the materials selected from the group of materials consisting essentially of recycled polyolefins, recycled bucket resin, recycled drum resin, densified film, recycled grocery bags, electric wire coating, and recycled bottle resin or any combination thereof.

4. (Allowed): The method of Claim 2 wherein said rubbery component is comprised of at least one of the materials selected from the group of materials consisting essentially of crumb rubber, automotive fluff, tire belt fluff, carpet backing, rubber backing and recycled circuit boards or any combination thereof.

5. (Allowed): The method of Claim 2 wherein said reinforcing filler is comprised of at least one of the materials selected from the group of materials consisting essentially of carbon black, fly ash, mica, fiberglass, ~~aragonite~~aragonite, crushed concrete, sand and crushed glass or any combination thereof.

6. (Allowed): The method of Claim 2 wherein said materials each comprise from about 25% to 55% of said mixture.

7. (Allowed): The method of claim 2 wherein said thermoplastic polymer and rubbery components comprise at least 20% of said mixture.

8. (Allowed): The method of claim 2 where in said mixture is heated by

frictional and/or compressive heating of said mixer.

9. (Allowed): The method of Claim 2 wherein said mixture is at least partially heated by an external heat source.

10. (Allowed): The method of Claim 9 wherein said mixture is heated to about 380 degrees to about 440 degrees.

11. (Allowed): The method of Claim 8 wherein said mixture is preferably heated to about 400 degrees to about 420 degrees.

12. (Previously Cancelled)

13. (Currently Amended): A process for forming a molded member for use as a railroad tie, ~~lumber~~ or other structural members, comprising the steps of:
mixing portions from about 25% to about 55% of a thermoplastic polymer,
with from about 4% to about 55% of a rubbery polymeric component;
with from about 4% to about 55% of a reinforcing filler in a Banbury mixer or other closed chamber mixer to mix until said portions to form a flowable mixture; and
extruding ~~feeding~~ said mixture into a mold having at plurality of ~~least one~~ side walls, said mixture ~~at least partially~~ filling said mold, ~~such that said mixture has at least one side surface and an interior portion;~~
using a piston and brake to control the filling of said mold; and
closing the mold when it is filled.

14. (Currently Amended): A polymeric composite for usage in molding applications for railroad ties or other structured members comprising:
a thermoplastic polymer component comprising recycled polyolefin, recycled copolymers thereof or combinations thereof and comprising about 25% to about 55% of said composite;

a recycled rubbery polymeric component comprising about 4% to about 55% of said composite;

a recycled reinforcing filler component comprising about 4% to about 55% of said composite; and, wherein said reinforcing filler is comprised of at least one of the materials selected from the group of materials consisting essentially of carbon black, fly ash, mica, fiberglass, aragonite, crushed concrete, sand and crushed glass and any combination thereof; and

a foaming agent comprising less than 1% of said composite;

wherein the thermoplastic polymer component, rubbery polymeric component, and reinforcing filler are heated by frictional and compressive mixing in an closed chamber mixer until such components reach about 380 °F to about 440 °F degrees.

15. (Cancelled)

16. (Allowed): A process for forming a member having a plurality of surfaces, for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing,

about 25% to about 55% of a thermoplastic polymer;

about 4% to about 55% of a rubbery polymeric component;

about 4% to about 55% of a reinforcing filler;

injecting said mixture into a mold having at least one wall, wherein said mixture at least partially fills said mold about said wall, such that said mixture has at least one side surface along said wall and an interior portion;

cooling said mixture whereby said at least one surface is at least partially hardened thereby at least partially forming a member;

removing said member from said mold before said interior portion is substantially hardened;

placing said member about a cooling apparatus

rotating said member about said cooling apparatus whereby said interior is at least substantially hardened; and

texturing at least one surface of said member.

17. (Newly Cancelled)

18-28. (Previously Cancelled)

29. (Newly Cancelled)

30. (Currently Amended): The process of Claim 13, further comprising the step of using a valve to control the feed of said mixture into said mold.

31. (Currently Amended): The process of Claim ~~30~~29, further comprising the step of using an extruder between said Banbury mixer or other ~~open~~enclosed chamber mixer and said valve to transport said mixture to said valve.

32. (Cancelled)

33. (Currently Amended): The process of Claim 31, further comprising the step of adjustably controlling a density of said extrudable material with a piston while the mold is being filled.

34. (Currently Amended & Allowable): A process for forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing portions from about 25% to about 55% of a thermoplastic polymer,

with from about 4% to about 55% of a rubbery polymeric component;

with from about 4% to about 55% of a reinforcing filler until said portions form a flowable mixture;

feeding said mixture into a mold having at least one side wall, said mixture at least partially filling said mold, such that said mixture has at least one side surface and an interior portion;

using a Banbury mixer or other ~~open~~ closed chamber mixer to mix said mixture;

using an extruder between said Banbury mixer or other closed chamber mixer and said valve to transport said mixture to said valve;

adjustably controlling a density of said extrudable material; and

~~The process of Claim 33,~~ wherein at least one brake and/or at least one gear is used to control said density.

35. (Currently Amended): The process of Claim 13, further comprising the step of ~~using a plurality of molds and filling at least one mold at a time.~~

36. (Currently Amended): The ~~apparatus process~~ of Claim 35, further comprising the step of using a ~~first diverter station valve and a second diverter station to~~ select the mold to be filled ~~fill at least one mold at a time.~~

37. (Currently Amended): The process of Claim 13, further comprising the step of cooling said molded mixture ~~whereby said at least one side surface until the mixture is at least partially hardened thereby at least partially forming a member.~~

38. (Newly Cancelled)

39. (Currently Amended): The process of Claim ~~13~~38, further comprising the step of placing the closed mold in a waterbath during cooling.

40. (Currently Amended): The process of Claim ~~39~~37, further comprising the steps of:
removing said member from said mold before an~~said~~ interior portion is hardened; and

rotating said member upon a cooling apparatus until said interior of said member is hardened and/or cooled; and

whereby said rotation relieves internal stresses and prevents warpage.

41. (Currently Amended & Allowable): A process for forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing portions from about 25% to about 55% of a thermoplastic polymer,

with from about 4% to about 55% of a rubbery polymeric component;

with from about 4% to about 55% of a reinforcing filler until said portions form a flowable mixture;

feeding said mixture into a mold having at least one side wall, said mixture at least partially filling said mold, such that said mixture has at least one side surface and an interior portion;

closing the mold after it is filled;

placing the closed mold in a waterbath during cooling;

removing said member from said mold before said interior portion is hardened;

~~The process of Claim 40, further comprising the steps of:~~

~~_____ placing said member within or about a cooling apparatus; and~~

~~rotating said member about said cooling apparatus until said interior of said member is at least substantially hardened and/or cooled.~~

42. (Currently Amended & Allowable): A process for forming a molded member for use as a railroad tie, lumber or other structural member, comprising the steps of:

mixing portions from about 25% to about 55% of a thermoplastic polymer,

with from about 4% to about 55% of a rubbery polymeric component;

with from about 4% to about 55% of a reinforcing filler until said portions form a flowable mixture;

feeding said mixture into a mold having at least one side wall, said mixture at least partially filling said mold, such that said mixture has at least one side surface and an interior portion;

closing the mold after it is filled;

placing the closed mold in a waterbath during cooling;

removing said member from said mold before said interior portion is hardened;

placing said member within or about a cooling apparatus;

rotating said member about said cooling apparatus until said interior of said member is at least substantially hardened and/or cooled; and

~~The process of Claim 41, further comprising the step of: texturing at least one surface of said member.~~

43-50 (Newly Cancelled)

51-67. (Previously Cancelled)

68 (New): The member of Claim 1, wherein said density is controlled by a brake and piston.

69. (New): The member of Claim 1, wherein said density is computer controlled by a piston.

70. (New): The member of Claim 1, having a predetermined length and wherein said density is constant along said length of said member.

71. (New): An individually molded member for use as a railroad tie or other structural member having a varied density, comprising:
a mixture of:
from about 25% to about 55% of a thermoplastic polymer;
from about 4% to about 55% of a rubbery polymeric component; and
from about 4% to about 55% of a reinforcing filler; and wherein said member is formed by extruding said mixture into an individual mold and wherein said varied density is controlled during a filling of said mold.

72. (New): The member of Claim 71, wherein said density is controlled by a brake and piston.

73. (New): The member of Claim 71, wherein said density is computer controlled by a piston.

74. (New): The member of Claim 71, having a predetermined length and wherein said density is varied along said length of said member.

75. (New): An individually or substantial individually molded member with at least one textured side surface for use as a railroad tie or other structural member, comprising:

a molded member having a plurality of side surfaces and comprised of
a mixture of:

from about 25% to about 55% of a thermoplastic polymer;
from about 4% to about 55% of a rubbery polymeric
component; and

from about 4% to about 55% of a reinforcing filler;
wherein at least one side surface of the member is textured after the member is molded.

76. (New): The member of Claim 75, wherein said member has a plurality of textured side surfaces.

77. (New): The member of Claim 75, whereby said surface is textured by applying an embossing pattern under heat and pressure to melt and deform at least one side surface of the member.

78. (New): The member of Claim 75, wherein said at least one textured surface comprises a plurality of indentations at least about 1/8 inch deep.

79. (New): The member of Claim 75, wherein said member is a tie and wherein said at least one textured surface comprises a plurality of indentations that provide surfaces perpendicular to a longitudinal axis of the tie.

80. (New): The member of Claim 75, wherein said at least one textured surface comprises a plurality of indentations at least about ¼ inch wide, but less than about 6 inches wide.

81. (New): The member of Claim 75, wherein said at least one textured surface provides corners or indentations to capture and hold ballast.

82. (New): The member of Claim 80, wherein said member is a tie having a plurality of sides with a textured surface comprising indentations that provide resistance to force across at least about 10% of said textured surface.

83. (New): A method for making an individually or substantially individually molded member with at least one textured side surface for use as a railroad tie or other structural member, comprising:

providing a molded member having a plurality of side surfaces that is comprised of a mixture of:

from about 25% to about 55% of a thermoplastic polymer;
from about 4% to about 55% of a rubbery polymeric
component; and
from about 4% to about 55% of a reinforcing filler; and
texturing at least one side surface of the member
after the member is molded.

84. (New): The method of Claim 83, wherein said member has a plurality of textured side surfaces.

85. (New): The method of Claim 83, further comprising the step of texturing said at least one surface by applying an embossing pattern under heat and pressure to melt and deform said at least one surface.

86. (New): The method of Claim 83, wherein said at least one textured surface comprises a plurality of indentations at least about 1/8 inch deep.

87. (New): The method of Claim 83, wherein said member is a tie and wherein said at least one textured surface comprises a plurality of indentations that provide surfaces perpendicular to a longitudinal axis of the tie.

88. (New): The method of Claim 83, wherein said at least one textured surface comprises a plurality of indentations at least about 1/4 inch wide, but less than about 6 inches wide.

89. (New): The method of Claim 83, wherein the textured surface of said member provides corners or holes to capture and hold ballast.

90. (New): The method of Claim 88, wherein said member is a tie having a plurality of sides with a textured surface comprising indentations that provide resistance to

force across at least about 10% of said textured surface.

91. (New): An improved system for supporting railroad rails, comprising:
a molded railroad tie, comprised of a mixture of
from about 25% to about 55% of a thermoplastic polymer;
from about 4% to about 55% of a rubbery polymeric
component;
from about 4% to about 55% of a reinforcing filler;
wherein the railroad tie has at least two side surfaces, a bottom surface,
and a first end and a second end, wherein at least one side surface and the bottom surface is
textured after molding and wherein the texturing comprises indentations at least about $\frac{1}{4}$
inch wide, but less than about 6 inches wide;
ballast placed below and around the railroad tie; and
steel rails mounted on the railroad tie.

92. (New): The system of Claim 91, wherein the textured surface comprises
indentations that provide surfaces perpendicular to the longitudinal axis of the railroad tie that
increases the frictional force between the railway crosstie and the ballast.

93. (New): The system of Claim 91, wherein the textured surface resists a force
by means of friction against the ballast placed below and around the railroad tie.

94. (New): The system of Claim 91, wherein the force is imposed by train wheels
and wherein the indentations provide resistance to force across at least about 10% of the
textured tie surface.

Appl. No.: 09/800,171
Amendment dated Dec. 5, 2003
Reply to Office action of Sept. 5, 2003

REMARKS

ALLOWABLE CLAIMS:

The Examiner indicated that Claims 2-11 and 16 have been allowed. The spelling of the word "arregonite" was corrected to the proper spelling aragonite in Claim 5 and in the specification.

CLAIM OBJECTIONS:

The Examiner objected to Claims 33, 34, 41, and 42 as being dependent upon a rejected base claim, but indicated such claims would be allowable if rewritten in independent form.

Claim 33, was instead further amended.

Claims 34, 41, and 42 are rewritten in independent form as per the Examiner's allowance. Please also note that in the rewritten Claim 34 the phrase "open chamber mixer" was changed to a "closed chamber mixer" as Applicant's attorney was mistaken in stating that the Banbury mixer was an open chamber mixer rather than a closed chamber mixer.

These changes are believed to cure the Examiner's objections, and still make the claims allowable.

CLAIM REJECTIONS - 35 U.S.C. § 102:

Claims 1, 13-15, 17, 29, and 43-50 are rejected under 35 U.S.C. § 102(b) as lacking novelty and as being anticipated by Sullivan, et al. (U.S. Patent No. 5,886,078), hereinafter '078 Patent. Specifically, the Examiner posits that the Sullivan '078 Patent discloses

polymeric compositions that are suitable for the production of members for use as railroad ties and lumber (Col. 1, lines 5-67), and that such compositions were taught as comprising thermoplastic polymer, rubbery polymer, and mica in relative amounts that overlap those in the current application. The Examiner further contends that the final articles are taught as being formed by both extrusion and molding processes in Column 8 lines 10-12 of the '078 Patent.

Applicants respectfully traverse the Examiner's rejections on the basis that certain features of the members are novel improvements, the mixing and molding processes to form the members are novel, the manner of using the composition is novel, the method of producing members with at least one textured side surface is novel, and none of these novel improvements are disclosed in the '078 Patent.

First independent Claim 1 has been amended to claim the members that have a constant density, wherein the density of the member is controlled during the filling of the mold. There are no such teachings in the '078 Patent.

Next, independent Claim 13 is directed to a novel process for forming a molded member wherein the composite is mixed in a Banbury mixer or other closed chamber mixer, extruding the mixture into a mold, and closing the mold when it is at least substantially filled. Further, the mixing and molding technology used in this application was not even known at that time of the filing of the earlier application and has taken years and millions of dollars to develop. This invention uses a different mixing mechanism, and is superior to that disclosed in the '078 Patent. The mixing in the '078 Patent was accomplished by an extruder. In this invention, Applicants use a closed chamber Banbury mixer to mix the components. This allows formulation of a more homogeneous mixture, which is also preferred since ingredients

can be added at different stages, similar to making a cake. This is especially advantageous since the fillers are preferably added near the end of the mixing stage. Now the extruder is used to pump the mixture as part of the injection process, rather than to mix. Again, the '078 Patent does not disclose this mixing process.

The invented molding process is also novel, and gives the tie different characteristics than the extruded tie or member. Moreover, the method of injection molding, using an extruder in conjunction with a piston and/or gear and/or brake was not known or disclosed in the '078 Patent. While the process disclosed in lines 11-12 of Column 8 refers to injection and compression molding, as by molding a member by compressive forces, there are no teachings of any specific way to mold the tie out of such materials and at that time, the inventors did not know how to achieve molding with those materials. In contrast, in the invention of the '078 Patent, the extruded material flowed through a die and made a member which was substantially the shape of the die and was of unlimited length. Upon exiting the die, the extruded member was directly placed in a cooled water bath where it hardened, and was pulled out of the die by rollers, or a similar type of pulling device, very similar to the traditional way that pipe is made. Subsequently, the member of unlimited length was sawed to size, thereby forming a somewhat imprecise end product. In short, the '078 Patent disclosed a traditional extrusion device and process. Extrusion is the "act or process of extruding" and extrude is defined as "[t]o shape (metal or plastic, for example) by forcing through a die." *See, e.g.,* The American Heritage Dictionary. In contrast, the newly invented molding process gives the tie different characteristics than the extruded tie or member of the '078 Patent.

Another unique feature of the invention is solving the problem of uniformly filling a

long mold. Due to the nature of a long mold, it is nearly impossible – if not impossible – to control the density of the mixture that is extruded introduced into a long mold, because the pressure varies, and the internal friction along the inside of the mold varies. In order to control the density and ensure consistent filling of the mold and integrity of the molded member, which is related to the strength of the member, the invention preferably uses a piston, brake and gearing, in conjunction with an extruder during the filling of the mold. Rather than filling a large void in an empty mold, a very small space is filled near or up against the face of the piston plate, and the piston is continually being moved away from the filled portion of the mold, preferably by a gear and a brake, which exerts resistance, which may also be preprogrammed to keep the density constant or variable as the mold is filled. This enables the formation of a member, with more uniform characteristics and enhanced structural integrity.

Independent Claim 14 has been amended to specify that the composite in the application is used for molding and molding applications and that the composite is heated by frictional mixing in a closed chamber mixer, whereas the '078 Patent used such composite in extrusion and primarily formation of the member by extrusion into a die, with the option of molding being briefly mentioned. Also, while the '078 Patent requires mica as a reinforcing filler, the new application discloses a variety of fillers which could be used. Also, because of improvements in the invented mixing technology disclosed in the application, it is not necessary to limit the size of the rubbery polymeric component such that about 90% by-weight will not pass through a hundred-mesh screen. The manner of mixing the composite materials by friction until the components reach a temperature of about 380 to about 440 degrees Farenheit prior to molding is also novel. Further, Applicants have amended their

claims by modifying the ranges of percentages of the thermoplastic polymer.

Independent Claim 71 and the claims that depend from it have been added to claim the members that have a varied density, wherein the density of the member is controlled during the filling of the mold. There are no such teachings in the '078 Patent.

Independent Claim 75 and the claims that depend from it are directed to a novel molded member comprised of the composite mixture, wherein at least one side surface is textured. This gives the molded member unique characteristics when placed upon or between ballast or other substrate. There are no such teachings in the '078 Patent.

Independent Claim 83 and the claims that depend from it are directed to a novel method for making a molded member comprised of the composite mixture, wherein at least one side surface is textured, and variations of the manner of texturing. There are no such teachings in the '078 Patent.

Independent Claim 91 and the claims that depend from it are directed to a novel system for supporting railroad rails using a textured tie placed upon or between ballast or other substrate. There are no such teachings in the '078 Patent.

Additionally, Applicants invented a cooling method for the molded member, wherein the member is taken out of the mold before the interior is cool. The member is then placed on a rack and rotated periodically to prevent warping.

Applicants respectfully traverse the Examiner's claim rejections on the basis that Applicants' invention possesses features and limitations not disclosed or claimed in the Sullivan, et al, '078 Patent. Applicants also respectfully traverse the Examiner's rejection because no single prior art reference, i.e., here the '078 Patent, discloses every limitation cited in the claim. A claim is anticipated only if each and every element set forth in the

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Reply to Office action of Sept. 5, 2003

claim(s) are found, either expressly or inherently described in a single prior art reference, and the identical invention must be shown in as complete detail as contained in the claim. It is not. Therefore, the amended and newly presented claims are patentable.

CLAIM REJECTIONS - 35 U.S.C. § 103:

Claims 30-32, and 35-40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Sullivan et al. (U.S. Patent No. 5,886,078) as discussed above, on the basis that the specific molding steps are purportedly conventional to the molding arts and would have purportedly been obvious to one skilled in the art.

Applicants respectfully traverse these rejections on that basis that such claims depend from an independent claim, which has been amended and is now patentable, and upon the basis that there is no evidence of record that that such steps are known or obvious to one skilled in the art.

CONCLUSION

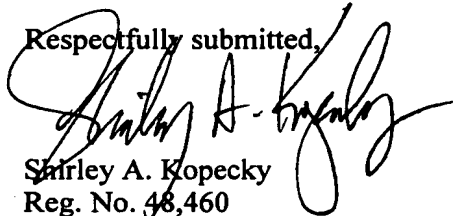
For the reasons submitted, Applicants respectfully submit that the added, unamended, and amended claims are patentable and completely overcome the Examiner's 35 U.S.C. 102 and 103 claim rejections, and that the Applicants' claims define novel structure and function, which is also unobvious. Again, not all elements of Applicants' invention are disclosed by the '078 Patent, thus Applicants' invention is not anticipated by the '078 Patent. Therefore, Applicants submit that these claims and amendments now place this application in condition for allowance. If the Examiner is of the opinion that the claims are not in condition for allowance then the Examiner is respectfully encouraged to contact the undersigned in order

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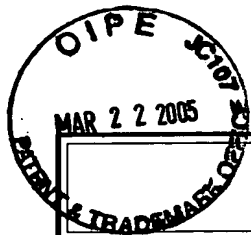
that this Application can be placed in allowable condition as soon as possible and without the need for further proceedings.

5 December 2003
Date

Respectfully submitted,



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TRANSMITTAL LETTER
(General - Patent Issued)

Docket No.
TieTek-001

Patentee(s): Sullivan, et al.

U.S. Patent No.

6,828,372

Issue Date

7 December 2004

Title:

Railroad Tie and Method of Making Same

COMMISSIONER FOR PATENTS:

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Dated: 3. 22. 2005.

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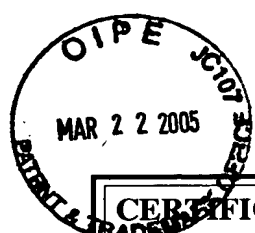
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CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)		Docket No.
Applicant(s): Sullivan, et al.		TieTek-001

Application No. US Pat. No. 6,828,372	Filing Date Issued: 7 December 2004	Examiner Cain, Edward J.	Customer No. 021897	Group Art Unit 1714
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Invention:

Railroad Tie and Method of Making Same

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